INFRASTRUCTURE - PUBLIC FACILITIES & SERVICES

Section 5.0

Draft

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Architecture+Planning

DOMESTIC WATER 5.1

Domestic water will be supplied to Serrano Summit by the Irvine Ranch Water District (IRWD). IRWD presently provides domestic water service to an approximate 179-square mile area in central Southern California. Serrano Summit's average daily water demand is approximately 200,000 gallons per day, or 224 acre feet per year. Potable water to serve the project site will be supplied per the Sub Area Master Plan (SAMP) to be prepared under the supervision of IRWD and the property owner.

At this time, the project has identified regional facilities for two points of connection possibilities to provide adequate domestic and fire water services to the site. The first point of connection is at the boundary line adjacent to Indian Ocean Drive, where an existing 12" water line has been stubbed out to this site. The second point of connection will be within Commercentre Drive at the intersection of Biscayne Bay Drive, where there exists another 12" water line. In order to reach the project site, approximately 300 linear feet of mainline pipe will be needed to be constructed off-site.

Existing regional facilities capable of providing service to Serrano Summit are listed below:

- An existing 12" domestic water line in Indian Ocean Drive; and
- An existing 12" domestic water line in Biscayne Bay Drive.

Facilities needed to provide flow and pressure in conformance with IRWD and fire department standards include mainline pipe sizes ranging from 8" to 12" and looped configurations to ensure pressure efficiencies.

Water System Development Standards

- All water lines shall be designed per IRWD requirements, installed underground in accordance with the requirements and specifications of the Orange County Health Department, and inspected per IRWD standards.
- The location of facilities shall conform to IRWD and City of Lake Forest standards.
- Water conservation measures will be incorporated into the development to include water saving devices and systems and including the use of reclaimed water for irrigation where possible.
- Any design of off-site facilities shall be coordinated with the affected property owners and IRWD.
- The design of all water facilities for the purposes of fire protection shall be subject to the review and approval of the Orange County Fire Authority.

RECLAIMED WATER 5.2

Reclaimed water will be supplied to Serrano Summit by IRWD. IRWD presently provides reclaimed water service to approximately 7,000 acres in the central Southern California area. Serrano Summit's average year reclaimed water demand is approximately 400 ac-ft. Reclaimed water, if available, will be used to irrigate landscaping in parks, streets, parkways, common areas and open space areas. Existing regional facilities capable of providing service to Serrano Summit include an existing reclaimed water mainline adjacent to the project site within Biscayne Bay Drive, and existing reclaimed water mainline at the southerly corner of the project site. All proposed IRWD reclaimed water facilities will be designed in conformance with IRWD standards. Standards typically would include a 4" or 6" looped mainline throughout the community. All facilities will be designed in accordance with the SAMP for this project, to be created under the supervision of IRWD and the property owner.

Reclaimed Water System Development Standards

- All reclaimed water lines shall be designed per IRWD requirements, installed underground in accordance with the requirements and specifications of the Orange County Health Department, and inspected per IRWD standards.
- The location of facilities shall conform to IRWD and City of Lake Forest standards.
- Reclaimed water facilities shall be constructed per IRWD standards for supplying reclaimed water to eligible irrigated lands.
- Water conservation measures will be incorporated into all development within Serrano Summit to include water saving devices and systems including the use of reclaimed water for irrigation where possible.
- Any design of off-site facilities shall be coordinated with the affected property owners and IRWD.

SEWER 5.3

Sewer service to Serrano Summit will be provided by IRWD. IRWD presently provides sewer service to approximately 179-square miles in central Southern California. Serrano Summit's average day wastewater generation is approximately 150,000 gallons. Wastewater generation, system hydraulics and facility planning will be based on the Sub Area Master Plan (SAMP) for the project, to be prepared under the supervision of IRWD and the property owner. According to IRWD standards, Serrano Summit will install transmission sewer mains ranging in size from 8 inches to 12 inches. Facilities needed to provide sewer service in conformance with IRWD standards include all facilities as referenced in the SAMP, as prepared by the IRWD.

Sewer System Development Standards

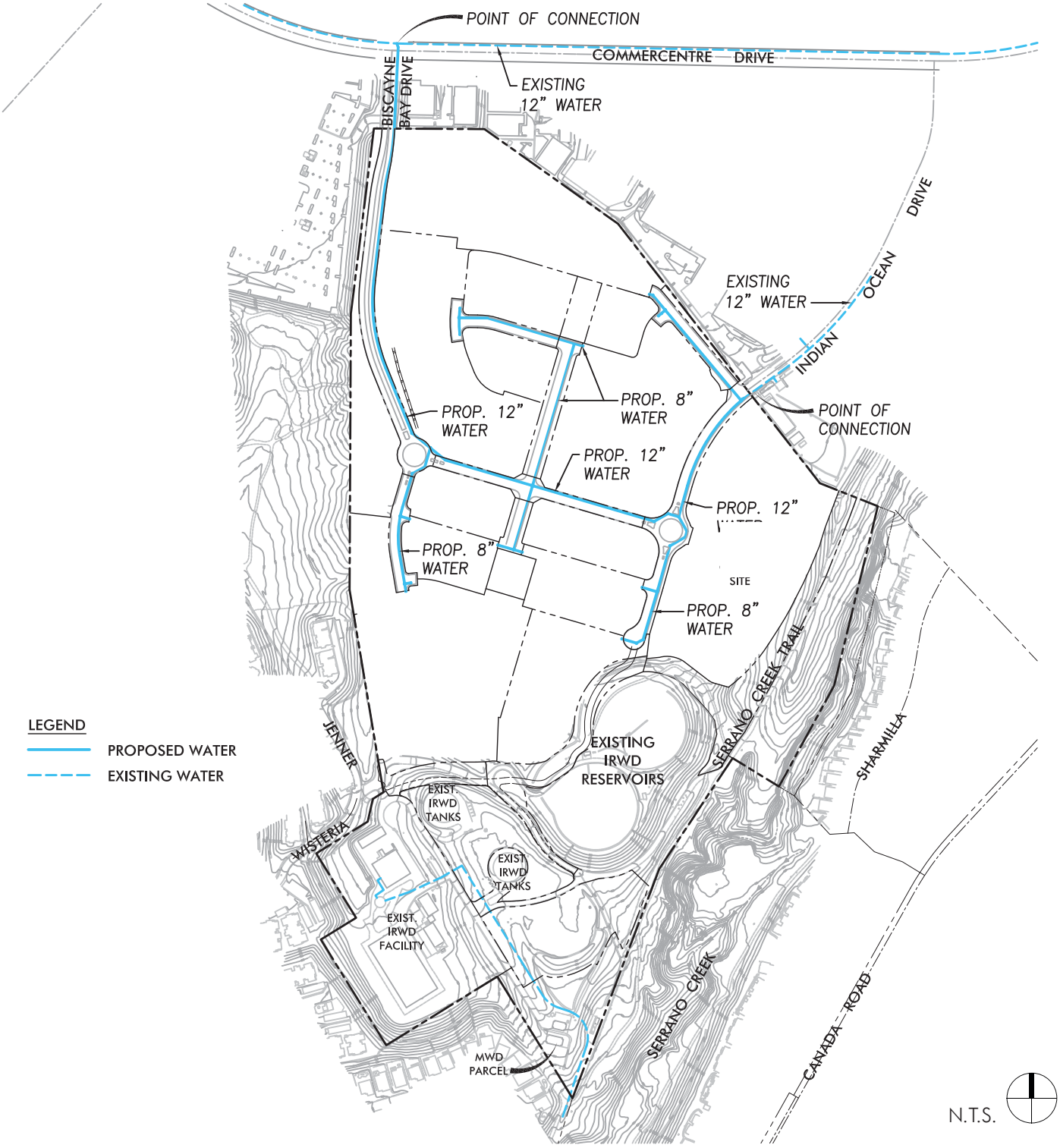
- All sewer lines shall be designed per IRWD requirements, installed in accordance with the requirements and specifications of the Orange County Health Department, and inspected per IRWD standards.
- The location of facilities shall conform to IRWD and City of Lake Forest standards.
- Any design of off-site facilities shall be coordinated with the affected property owners and IRWD.

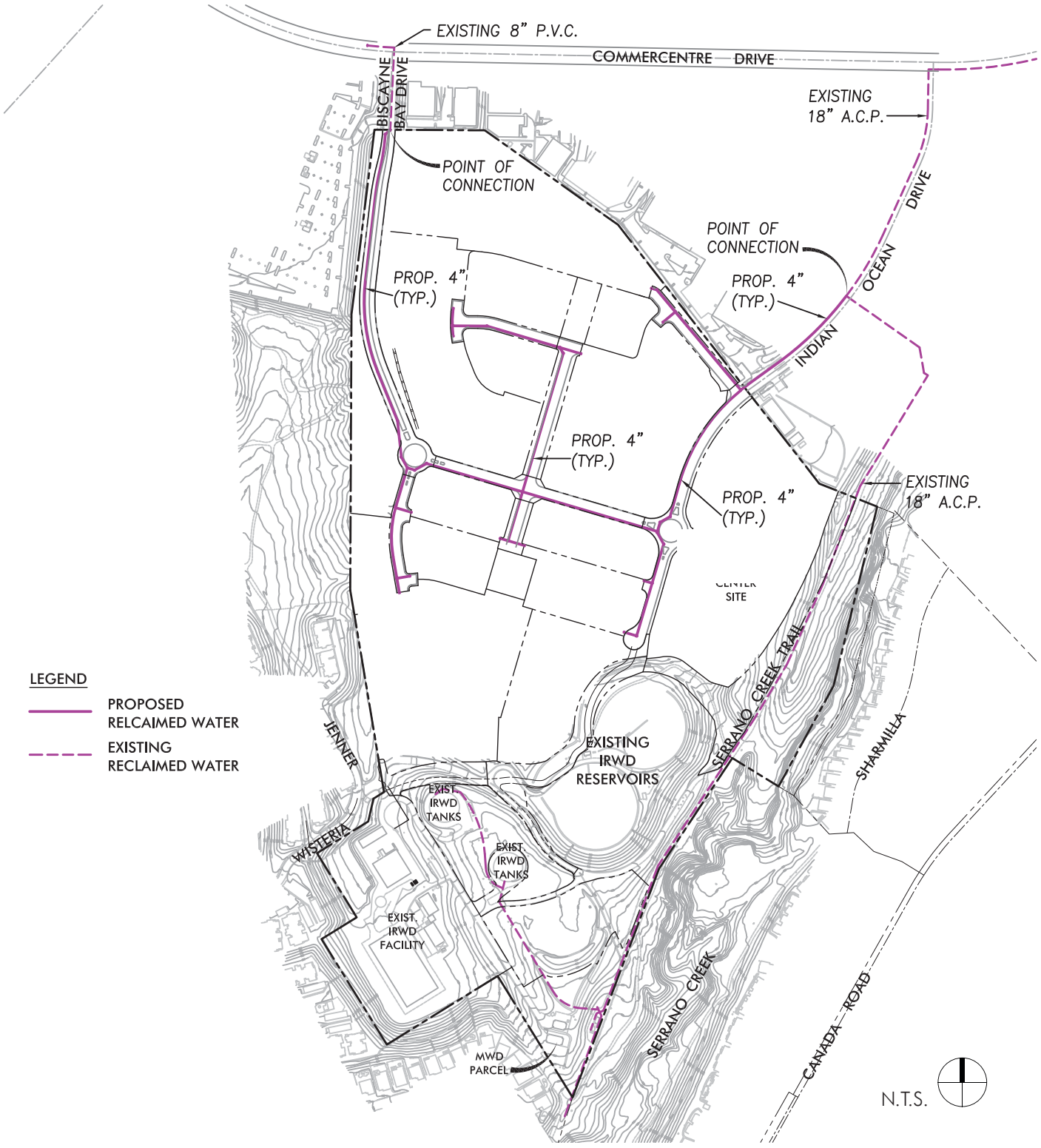
DRAINAGE 5.4

The Serrano Summit project proposes a comprehensive system intended to collect, convey and deliver storm flows in accordance with both City of Lake Forest and County of Orange requirements. The primary goal of the storm water management system is to prevent flooding and protect property by providing safe, effective site drainage. Serrano Summit contains approximately four existing drainage areas ranging in size from 2 acres to 59 acres. The existing regional storm drain facility capable of serving Serrano Summit is the Serrano Creek to the southeast of the site. Hydrology, hydraulics and facility planning are based on a preliminary hydrology report dated June 2008 by Fuscoe Engineering. The storm water management system generally consist of the following conveyance facilities: Terrace drains, down drains, outlet structures, parkway culverts, earthen swales, area drainage systems, underground piping, catch basins, manholes, junction structures, and energy dissipaters. The Serrano Summit storm drain system also includes a detention area in the park just north of private 'D' Street (in Planning Area 15).

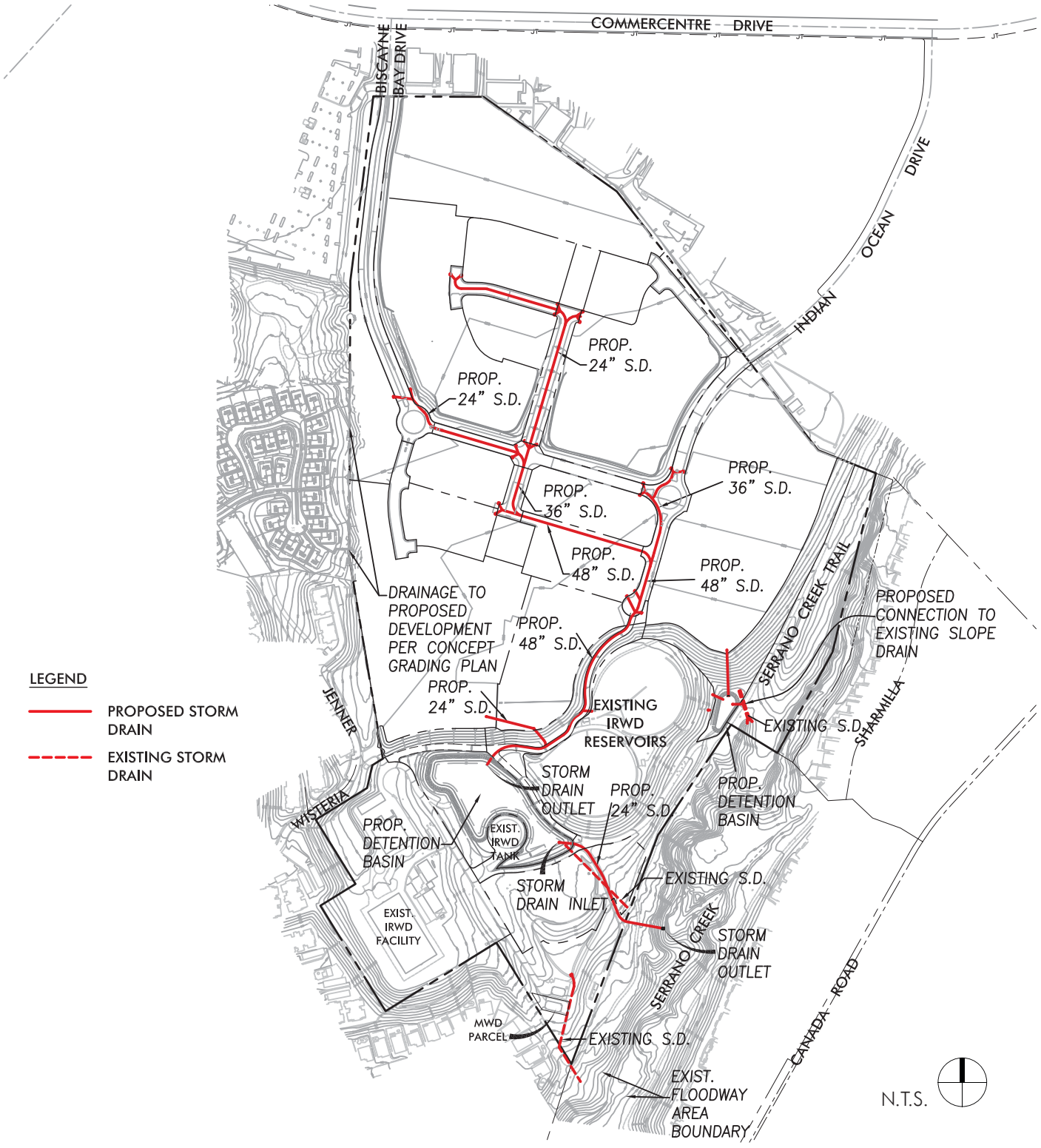
Drainage Development Standards

- Drainage and flood control facilities and improvements shall be provided in accordance with the City of Lake Forest and the County of Orange requirements.
- Storm drain facilities shall ensure the acceptance and disposal of 100-year storm runoff without damage to streets or adjacent property.
- All areas within Serrano Summit will be required to prepare a Storm Water Pollutant Prevention Plan (SWPPP) in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) standards.


POINT OF CONNECTION
COMMERCENTRE DRIVE
EXISTING 12" WATER
BISCAYNE BAY DRIVE
EXISTING 12" WATER
OCEAN DRIVE
INDIAN
PROP. 12" WATER
PROP. 8" WATER
POINT OF CONNECTION
PROP. 12" WATER
PROP. 12"
PROP. 8" WATER
SITE
PROP. 8" WATER
SERRANO CREEK TRAIL
SHARMILLA
JENNIER
EXISTING IRWD RESERVOIRS
EXIST. IRWD TANKS
WISTERIA
EXIST. IRWD TANKS
EXIST. IRWD FACILITY
SERRANO CREEK
MWD PARCEL
CANADA ROAD
LEGEND
PROPOSED WATER
EXISTING WATER
N.T.S.

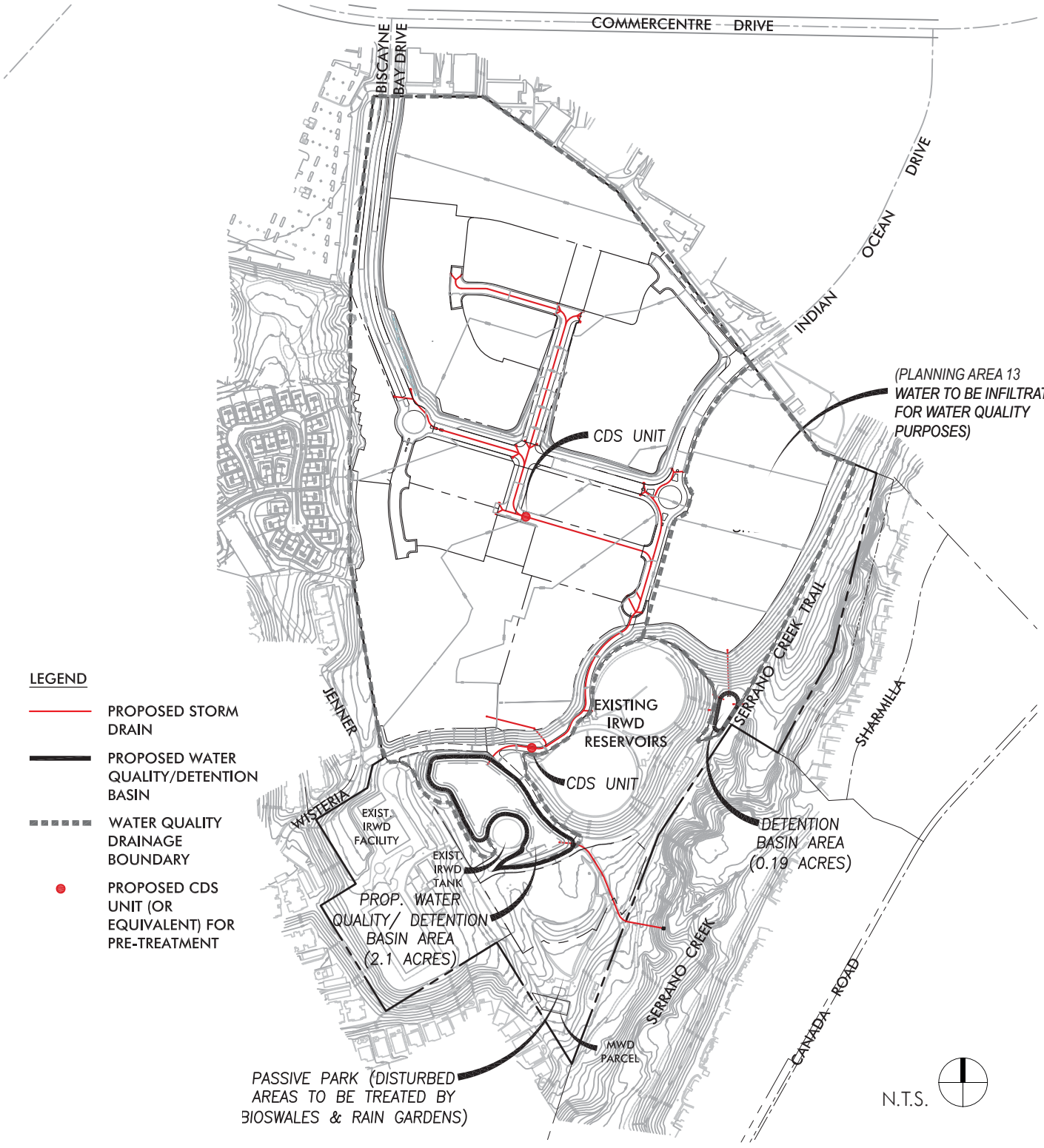

EXISTING 8" P.V.C.
COMMERCENTRE DRIVE
BISCAYNE BAY DRIVE
EXISTING 18" A.C.P.
POINT OF CONNECTION
POINT OF CONNECTION
OCEAN DRIVE
PROP. 4" (TYP.)
PROP. 4" (TYP.)
INDIAN
PROP. 4" (TYP.)
PROP. 4" (TYP.)
EXISTING 18" A.C.P.
SITE
LEGEND
PROPOSED RELCAIMED WATER
EXISTING RECLAIMED WATER
SERRANO CREEK TRAIL
JENNER
EXISTING IRWD RESERVOIRS
SHARMILLA
EXIST. IRWD TANKS
WISTERIA
EXIST. IRWD TANKS
EXIST. IRWD FACILITY
SERRANO CREEK
CANADA ROAD
MWD PARCEL
N.T.S.


COMMERCENTRE DRIVE
EXISTING SEWER
BISCAYNE BAY DRIVE
INDIAN OCEAN DRIVE
EXISTING SEWER
PROP. 8" SEWER
PROP. 8" SEWER
PROP. 8" SEWER
PROP. 8" SEWER
SITE
PROP. 12" SEWER
SERRANO CREEK TRAIL
SHARMILLA
JENNER
WISTERIA
EXISTING IRWD RESERVOIRS
EXIST. IRWD TANK
EXIST. IRWD FACILITY
PROP. 12" SEWER
EXISTING 15" SEWER
SERRANO CREEK
CANADA ROAD
MWD PARCEL
PROPOSED SEWER BY OTHERS
LEGEND
PROPOSED SEWER
EXISTING SEWER
N.T.S.


COMMERCENTRE DRIVE
BISCAYNE BAY DRIVE
OCEAN DRIVE
INDIAN
PROP. 24" S.D.
PROP. 24" S.D.
PROP. 36" S.D.
PROP. 36" S.D.
PROP. 48" S.D.
PROP. 48" S.D.
PROP. 48" S.D.
PROP. 24" S.D.
DRAINAGE TO PROPOSED DEVELOPMENT PER CONCEPT GRADING PLAN
SERRANO CREEK TRAIL
PROPOSED CONNECTION TO EXISTING SLOPE DRAIN
EXISTING IRWD RESERVOIRS
EXISTING S.D.
SHARMILLA
JENNER
WISTERIA
STORM DRAIN OUTLET
PROP. 24" S.D.
PROP. DETENTION BASIN
PROP. DETENTION BASIN
EXIST. IRWD TANK
STORM DRAIN INLET
EXISTING S.D.
EXIST. IRWD FACILITY
SERRANO CREEK
STORM DRAIN OUTLET
MWD PARCEL
EXISTING S.D.
CANADA ROAD
EXIST. FLOODWAY AREA BOUNDARY
N.T.S.
LEGEND
PROPOSED STORM DRAIN
EXISTING STORM DRAIN

WATER QUALITY 5.5

A Water Quality Management Plan (WQMP) will be prepared for the grading and drainage operations for Serrano Summit, designed to filter and treat surface runoff in a manner to comply with requirements of the City of Lake Forest and the Regional Water Quality Control Board. To mitigate potential impacts, this WQMP relies on a variety of facilities, each specifically located within the system to provide incremental removal of urban pollutants. The applicant will comply with requirements of the National Pollutant Discharge Management Elimination System (NPDES) permit. The applicant will provide Best Management Practices (BMPs) to control discharges of pollutants into receiving waters. Plans for such improvements shall be approved by the City of Lake Forest. The main feature of this WQMP is a 2.1 acre detention/water quality basin located in the area adjacent to the two above ground tanks in the southerly portion of the site.


COMMERCENTRE DRIVE
BISCAYNE BAY DRIVE
OCEAN DRIVE
INDIAN
(PLANNING AREA 13 WATER TO BE INFILTRATED FOR WATER QUALITY PURPOSES)
CDS UNIT
JENNER
EXISTING IRWD RESERVOIRS
SERRANO CREEK TRAIL
SHARMILLA
CDS UNIT
WISTERIA
EXIST. IRWD FACILITY
EXIST. IRWD TANK
DETENTION BASIN AREA (0.19 ACRES)
PROP. WATER QUALITY/ DETENTION BASIN AREA (2.1 ACRES)
SERRANO CREEK
MWD PARCEL
CANADA ROAD
PASSIVE PARK (DISTURBED AREAS TO BE TREATED BY BIOSWALES & RAIN GARDENS)
N.T.S.
LEGEND
PROPOSED STORM DRAIN
PROPOSED WATER QUALITY/DETENTION BASIN
WATER QUALITY DRAINAGE BOUNDARY
PROPOSED CDS UNIT (OR EQUIVALENT) FOR PRE-TREATMENT

GRADING 5.6

Grading for the Serrano Summit project reflects a conceptual grading approach consistent with requirements of the City of Lake Forest and the County of Orange and includes mass graded pads at a minimum of 1% slope. More detailed grading plans will be required as part of the approval of any Tentative and Final subdivision maps. In general, considerations while preparing the concept grading plan include preservation of existing edge conditions, where possible, and to minimize any export or import. Additionally, terracing of the site was implemented to preserve and enhance views and develop flat pads such that conventional product types could be efficiently land planned.

The Conceptual Grading Plan shall be used as a guide for the final grading design.

Grading work shall be balanced on-site, and within adjacent development phases, if possible. If a development proposal does not include an entire Planning Area, then prior to the approval of the proposed development an overall conceptual grading plan for the entire planning area shall be submitted for Planning Department approval. The conceptual grading plan for each planning area shall be used as a guideline for the preparation and evaluation of subsequent detailed grading plans for individual stages of development within that Planning Area. The conceptual grading plans for any Planning Area shall include preliminary pad and roadway elevations. Grading plans submitted for review and approval should include a plan for the mass grading and movement of large quantities of dirt from one area of the development to another for balance purposes. Rough grading plans should include information detailing movement of dirt to rough grade elevations that approximates the final finished grades and a precise grading plans should include information detailing movement of dirt to a finished grade tolerance required for the construction of structures and road improvements.

The existing elevations at the project site range from approximately elevation 540 at the south corner of the site to approximately elevation 705 near the northwest corner of the site which is close to the Biscayne Bay Drive entrance. To the south beyond the proposed residential development, there are four IRWD tanks on-site — two underground tanks and two above ground tanks. These four tanks are located at the southern portion of the site and are at approximately elevations 628 for the top of the buried tanks, 605 and 595 for the above ground tanks. The terrain is irregular with respect to grading; however, the site tends to drain from the north to the south at a gross level, at a more detailed level there are berms, knobs, basins, slopes, terracing, and many storm drain features to collect water and remove off-site.

The midsection of the site is relatively flat having slopes in the range of 1.5% to 2.0%, the west edge has a berm type effect being much higher than the middle/gut portion of the site, as the east edge has down slopes with terracing and drainage channels that collect water and take it off-site with an existing storm drain outlet. As the site progresses southward, there are slopes and additional terracing to get to the top of the underground tanks, and to get to the pad levels of the above ground tanks. At that point, there are access roadways for IRWD facility maintenance, and a host of underground infrastructure to feed these facilities.

Given the irregularity of the existing grade, the water quality issues with regard to Water Quality/ Detention basin location options, and the land use plan, the site will be transformed into mass graded pads with two main terraces, while keeping the southerly IRWD facility area largely intact. The upper tier occurs just north of 'A' Street and 'B' Street and ranges in height from approximately 24' to 28' above the lower tier just south of 'A' Street and 'B' Street. The existing berm on the west edge has been knocked down for view purposes and the sump on the east edge has been filled in in order to form the proposed new Civic Center pad. The lower tier extends from 'B' Street to the existing terrace just north of the existing underground tanks. This terrace assists with views while maintaining original land forms and aiding with a proposed balance cut and fill site. An area between the two above ground tanks will be graded out for the water quality/detention basin and the dirt from that excavation will be used to the north for required fill areas. Regarding the cut, fill, and balance concepts, the cut areas generally are as follows:

- The northerly edge from Indian Ocean Drive west to the westerly property line - average 15';

- The west edge of the property southerly to the IRWD facilities area (with the exception of filling one ravine) – average 20';
- An area of cut that starts south of 'B' Street and encompasses the westerly midsection of that mass graded pad area – average 25';
- The fill areas of the site are generally in the middle of the upper tier – average 13';
- The entire east side where the Civic Center site is proposed - average 40';
- There is also a sizeable fill area just north of the above ground tanks – average 16'.

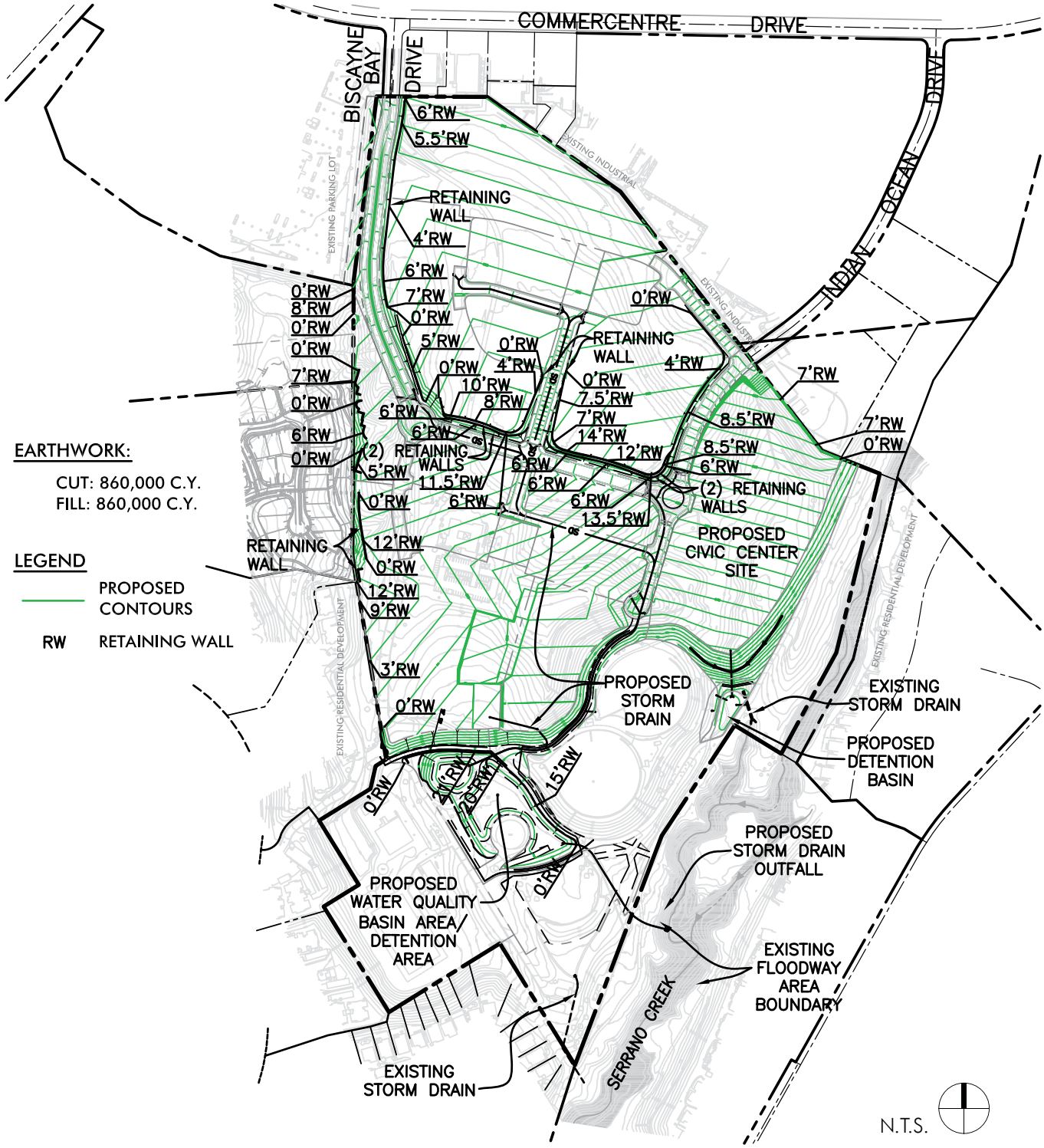
In addition to those cut and fill areas, there will be remedial grading requirements per the soils engineer, which will account for some additional cut and fill. Preliminary calculations for the earthwork include accommodations for bulking of some of the cut material, shrinkage of some of the cut material, and subsidence of some of the fill material. All this considered, it appears that the graded portions of Serrano Summit are close to a balanced site.

Exhibit 5-7 shows two site-wide grading cross sections (Section A-B-C and Section D-E) through Serrano Summit. In addition, a three-dimensional mesh model depicting the actual grading of the Serrano Summit site is shown in Exhibit 5-8, 3D Grading Model.

Grading Plan Development Standards

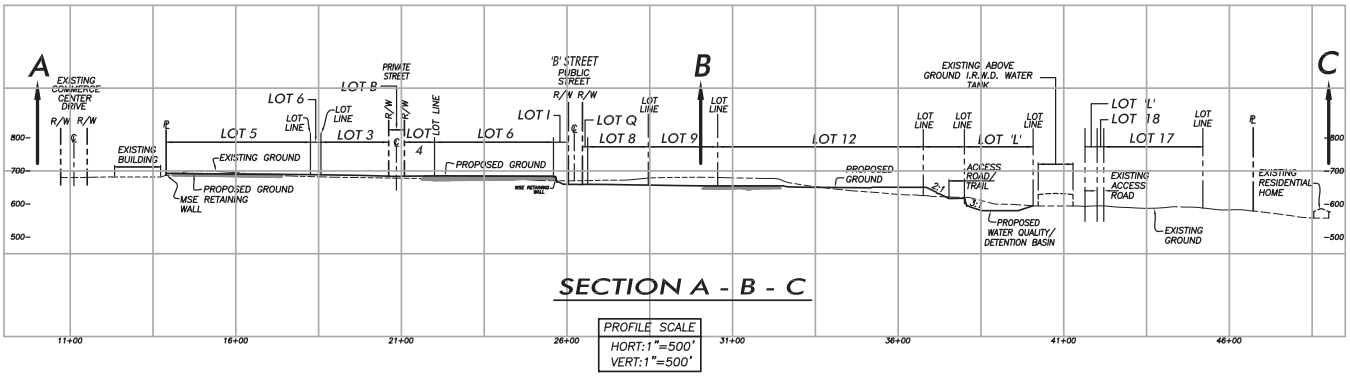
- After approval of a tentative tract map, the developer may submit plans for rough grading.
- After approval of a tentative tract map, the developer may submit plans for rough grading.
- A grading permit shall be obtained from the City of Lake Forest, as required by the City of Lake Forest, prior to grading.
- All public collector and local streets shall have a minimum gradient of 1%.
- All private streets and drives shall have a minimum gradient of 0.5%.
- Prior to initial grading activities, a detailed geotechnical study shall be prepared to analyze on-site soil conditions and slope stability.
- Slopes exceeding ten feet (10') in vertical height are allowed provided they are recommended to be safe in a Slope Stability Report prepared by a soils engineer or an engineering geologist and approved by the City of Lake Forest's City Engineer. Orange County Grading Code will be observed with regard to slope setback requirements.
- The applicant shall be responsible for maintenance and upkeep of all planting and irrigation systems until those operations are the responsibilities of other parties.
- Potential brow ditches, terrace drains, or other minor swales, as determined necessary by the City of Lake Forest at future stages of project review, shall be in conformance with the Orange County standards.
- In order to achieve an earthwork balance within any development phase, grading may encroach into an area of future development. Encroachment into these areas may involve the borrowing or temporary stockpiling of dirt to balance areas in the order of the project phasing. If such is the case, grading plans shall be prepared for this purpose and grading will be performed in a manner consistent with the Orange County and City of Lake Forest requirements. The overall Conceptual Grading Plan for the project will be used as a guide for the overall project as well as any conceptual grading plans for an individual planning area. Any off-site grading shall adhere to all Orange County and City of Lake Forest requirements and these Grading Plan development standards. Any grading involving another parcel must have the permission of all applicable property owners and appropriate easement documents.
- Graded land that is undeveloped shall be maintained weed-free, treated with soil binder, or other approved methods of soil stabilization, to prevent dust and dirt erosion. Planting with interim landscaping shall comply with NPDES Best Management Practices for wind and water erosion control.

GRADING CONCEPT PLAN EXHIBIT 5-6



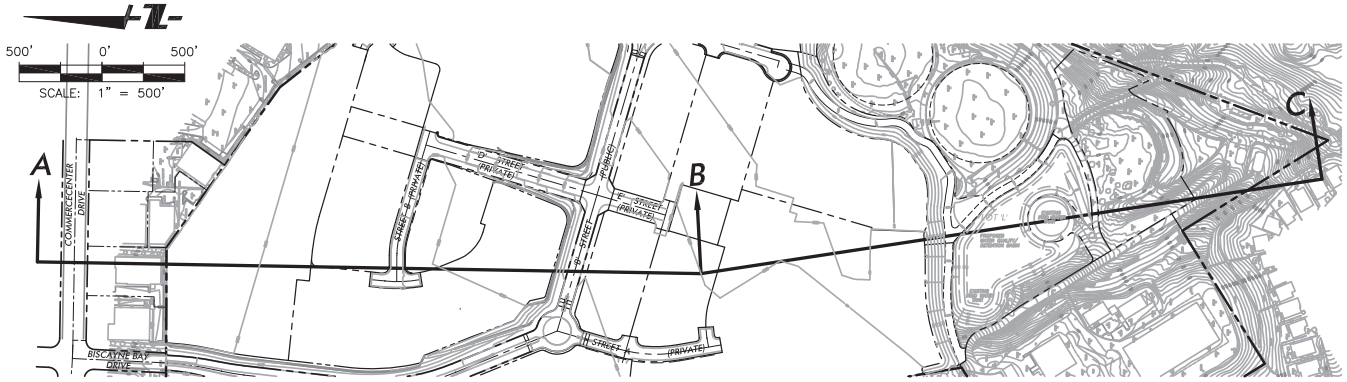
SITE-WIDE GRADING CROSS SECTIONS

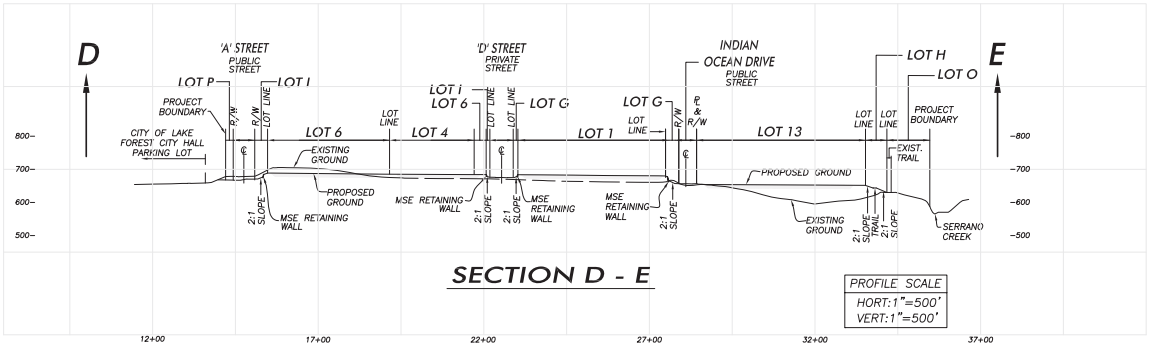
EXHIBIT 5-7



SECTION A - B - C

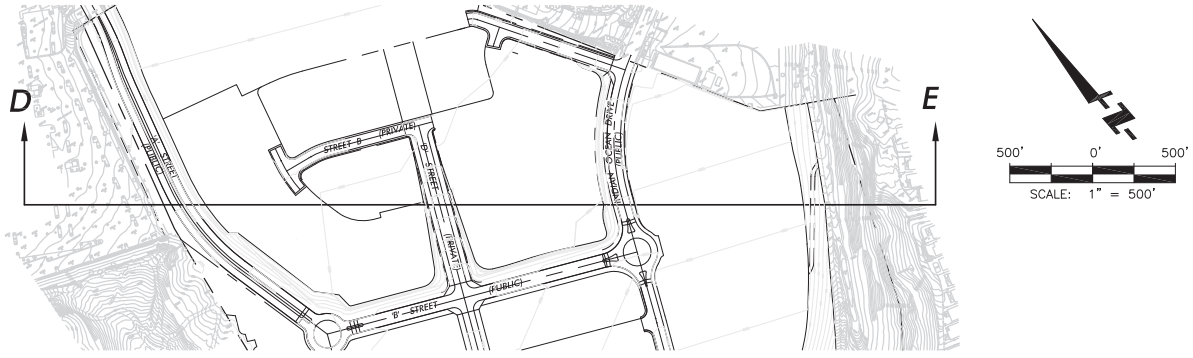
PROFILE SCALE
HORT: 1"=500'
VERT: 1"=500'





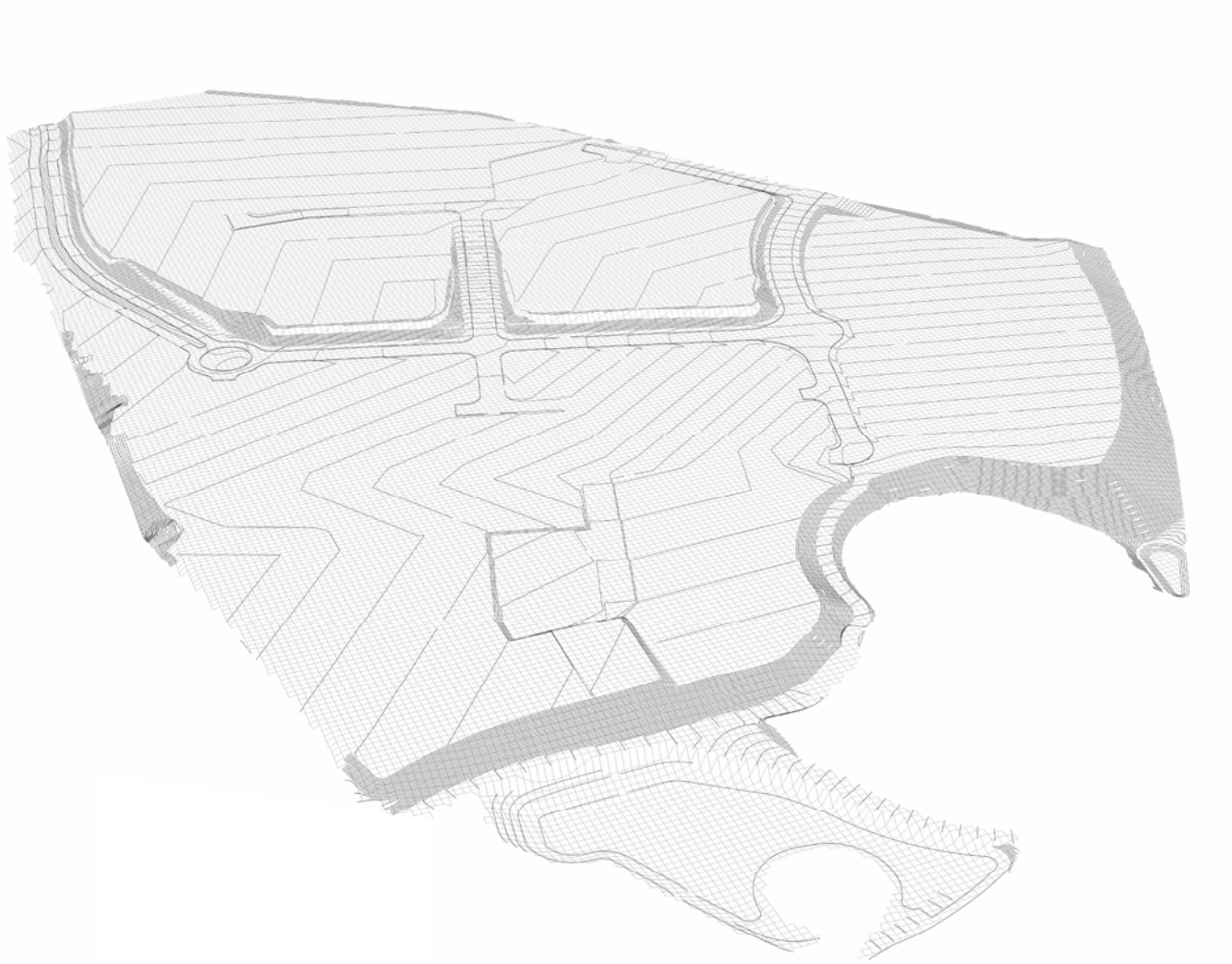
SECTION D - E

PROFILE SCALE
HORT: 1"=500'
VERT: 1"=500'



3-D GRADING MODEL

EXHIBIT 5-8



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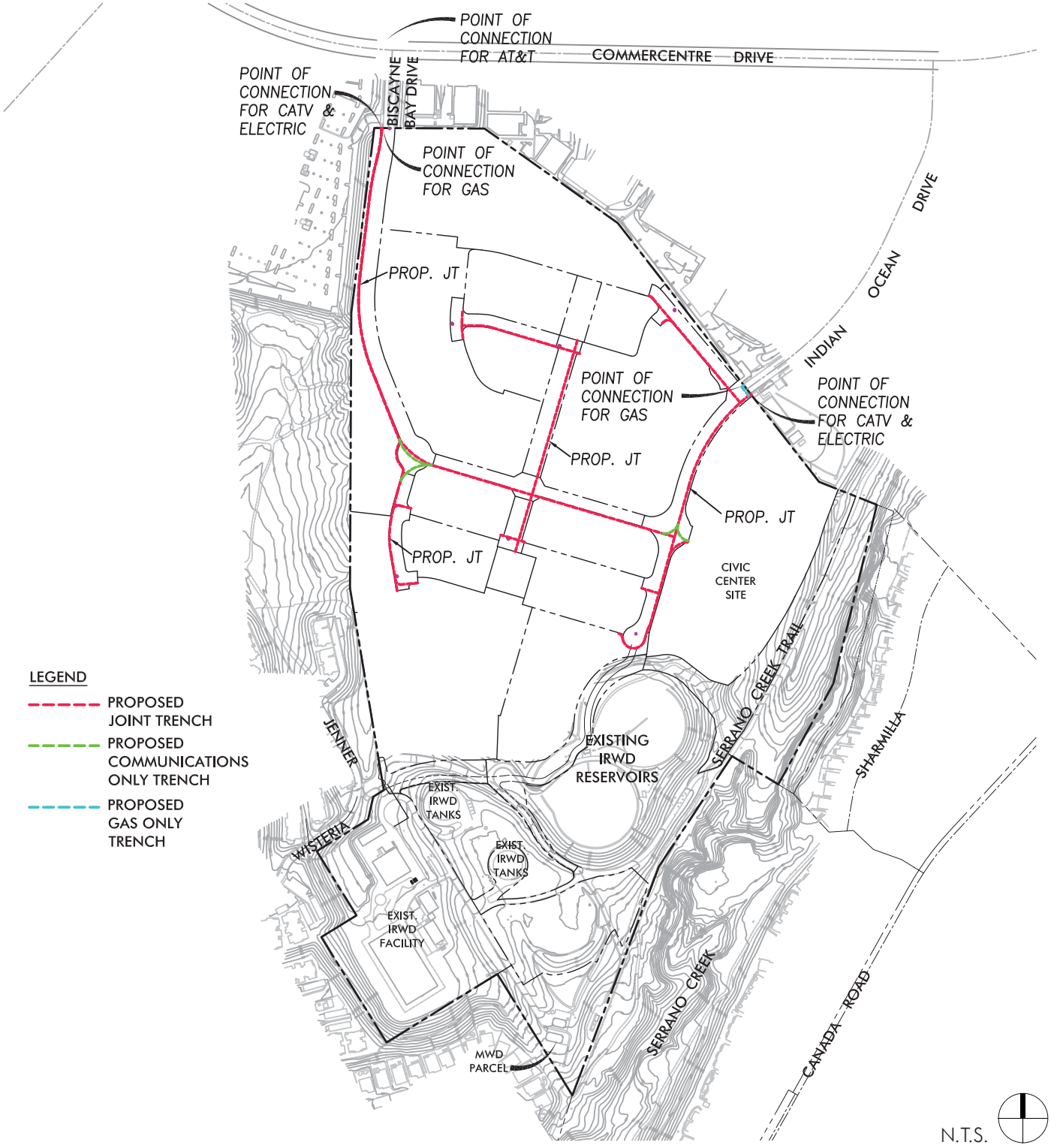

POINT OF CONNECTION FOR AT&T
COMMERCENTRE DRIVE
POINT OF CONNECTION FOR CATV & ELECTRIC
BISCAYNE BAY DRIVE
POINT OF CONNECTION FOR GAS
PROP. JT
OCEAN DRIVE
INDIAN
POINT OF CONNECTION FOR GAS
POINT OF CONNECTION FOR CATV & ELECTRIC
PROP. JT
PROP. JT
PROP. JT
CIVIC CENTER SITE
SERRANO CREEK TRAIL
SHARMILLA
JENNER
EXISTING IRWD RESERVOIRS
EXIST. IRWD TANKS
EXIST. IRWD TANKS
WISTERIA
EXIST. IRWD FACILITY
MWD PARCEL
SERRANO CREEK
CANADA ROAD
LEGEND
PROPOSED JOINT TRENCH
PROPOSED COMMUNICATIONS ONLY TRENCH
PROPOSED GAS ONLY TRENCH
N.T.S.

COMMUNITY FACILITIES 5.7

Civic Center

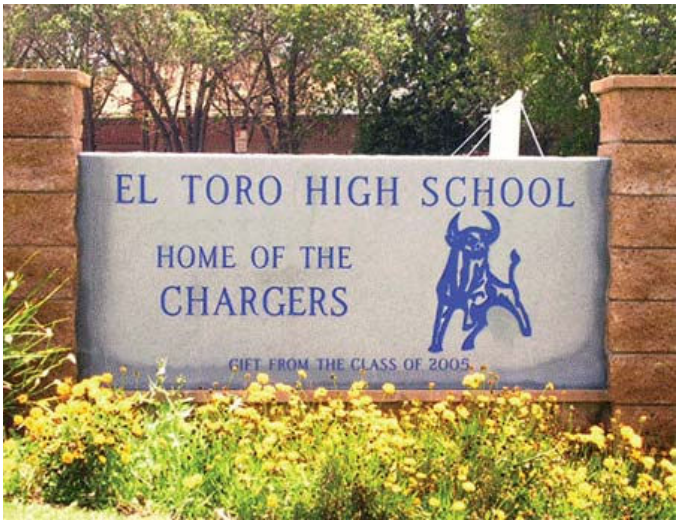
An 11.9 gross acre site in Serrano Summit may be developed as a new civic center for the City of Lake Forest per the Public Facilities Overlay. Civic center land provided by the project developer will be offered and accepted pursuant to the Serrano Summit Development Agreement.

Schools

Saddleback Valley Unified School District is the school district serving the K-12 school needs of the Serrano Summit community. Schools within the vicinity of Serrano Summit that may serve the K-12 school level needs of the community include:

- Lake Forest Elementary School (21801 Pittsford Drive, Lake Forest)
- Rancho Cañada Elementary School (21801 Winding Way, Lake Forest)
- Serrano Intermediate School (24642 Jeronimo, Lake Forest)
- El Toro High School (25255 Toledo Way, Lake Forest)

The developer will pay school mitigation fees as required by the State of California and specified in the Serrano Summit Development Agreement.



Police / Sheriff

Police services for the City of Lake Forest are provided by contract with the Orange County Sheriff's Department. The developers of Serrano Summit will pay the required impact fee for police services pursuant to the conditions of approval of any tentative tract map for development.

Fire

Fire services in the City of Lake Forest are provided by the Orange County Fire Authority. The developers of Serrano Summit will pay the required impact fee for fire protection services pursuant to the conditions of approval of any tentative tract map for development.

Library

The developers of Serrano Summit will pay the required library fees pursuant to the conditions of approval of any tentative tract map for development.

Solid Waste

Waste Management provides waste collection and disposal in Lake Forest. Waste Management will provide solid waste collection and disposal services to Serrano Summit.

Parks

Serrano Summit incorporates 6.1 acres of parkland including a 1.9 acre recreation center. The parkland and recreation center will be improved and dedicated by the project master developer to the City of Lake Forest pursuant to the terms contained in the Serrano Summit Development Agreement.

Other Public Facilities

The developers of Serrano Summit will pay the required impact fee for public facilities pursuant to the terms contained in the Serrano Summit Development Agreement.

TECHNOLOGY PLAN 5.8

The responsibility for enforcement of the following provisions shall be through the master developer.

Network Description

Developers should strive to implement the most advanced networks commercially available at Serrano Summit. Networks should be based upon technology that is commercially proven and stable for deployment in commercial environments.

Network refers to the assembly of components, software, and network management tools linked together in a single cohesive web for the purpose of effectively and efficiently transporting and switching all communications signals within Serrano Summit in a reliable and cost-effective manner.

Networks should be planned with four architectural objectives in mind:

1. The networks should be scalable; that is, easily and seamlessly scaled up or down, without interruption, to support increased or decreased users or volumes of traffic.
2. The networks should be open: that is, the networks employ an Open System Interconnection (OSI) design framework. The networks must have the ability to support any standard device attached to the network irrespective of the vendor or manufacturer.
3. The networks should be adaptable; that is, the network will need to adapt to the needs of any user, for any combination of voice, data, or image.
4. The networks must be evolvable; that is, the networks must employ a design concept recognizing the future will present technology innovations and user-community changes that cannot be foreseen today.

These four characteristics – scalable, open, adaptable, and employable – define the networks developers must deploy to serve Serrano Summit.

Infrastructure

Open Systems refers to an environment that is designed and constructed in a way that will allow any set of hardware and software to operate on the system, if the hardware and software have been designed and built in compliance with Open Systems Interconnection (OSI) standards. OSI is an internationally accepted framework for standards of communication systems. OSI was developed by the International Standards Organization (ISO) and is the only internationally accepted framework of standards for communication between different systems made by different vendors. The OSI model organizes the communications process into seven layered categories. Each layer in the sequence ensures the operability of the next layer. The seven layers are:

- Layer 1 – The Physical Layer
- Layer 2 – The Data Link Layer
- Layer 3 – The Network Layer
- Layer 4 – The Transport Layer
- Layer 5 – The Session Layer
- Layer 6 – The Presentation Layer
- Layer 7 – The Application Layer

Implementation

Many implementation models have been attempted by developers to ensure their communities have access to world-class communications services. The method of implementation sought for Serrano Summit is as follows:

Strategic Partnering

This implementation practice calls for the developer to forge a collaboration with one or more service providers, whereby the provider(s) agree to deploy advanced infrastructure in exchange for establishing a business relationship that will convey a marketing advantage for the service provider. Normally, this marketing advantage comes in the form of an endorsement or co-branding. This strategy is principally employed where the developer has no interest in investing or establishing a competency in communications and technology, but trades the marketing support for advanced infrastructure. Strategic partnering can be employed for one or all communications services. Strategic Partnering is the approach most commonly employed in large master-planned communities and will be the approach used in Serrano Summit.

Residential Wiring Specifications

To take full advantage of an all-fiber network, developers at Serrano Summit must contemplate an inside-the-home wiring distribution system. This wiring standard is called a "structured" wiring standard or "smart home" wiring standard and is a requirement of all developers and builders at Serrano Summit. Each housing unit must meet this minimum standard, and the wiring system must be tested and certified, prior to securing the certificate of occupancy.

Transmission & Wireless Communication Towers

Transmission towers and wireless communication towers shall be prohibited in all planning areas within Serrano Summit, with the exception of Planning Area 19. Transmission towers and wireless communication towers are permitted pursuant to the regulations contained in Chapter 10, "Development Regulations," of this Area Plan.